National Institute of Environmental Health Sciences

The role of interferon antagonist, non-structural proteins in the pathogenesis and emergence of arboviruses

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Abstract:

A myriad of factors favor the emergence and re-emergence of arthropod-borne viruses (arboviruses), including migration, climate change, intensified livestock production, an increasing volume of international trade and transportation, and changes to ecosystems (e.g., deforestation and loss of biodiversity). Consequently, arboviruses are distributed worldwide and represent over 30% of all emerging infectious diseases identified in the past decade. Although some arboviral infections go undetected or are associated with mild, flu-like symptoms, many are important human and veterinary pathogens causing serious illnesses such as arthritis, gastroenteritis, encephalitis and hemorrhagic fever and devastating economic loss as a consequence of lost productivity and high mortality rates among livestock. One of the most consistent molecular features of emerging arboviruses, in addition to their near exclusive use of RNA genomes, is the inclusion of viral, non-structural proteins that act as interferon antagonists. In this review, we describe these interferon antagonists and common strategies that arboviruses use to counter the host innate immune response. In addition, we discuss the complex interplay between host factors and viral determinants that are associated with virus emergence and re-emergence, and identify potential targets for vaccine and anti-viral therapies.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3185780

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Human Conflict/Displacement, Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease, Zoonotic Disease

Vectorborne Disease: Flea-borne Disease, Mosquito-borne Disease, Tick-borne Disease

Flea-borne Disease: Flea-borne Diseases, General

Mosquito-borne Disease: Chikungunya, General Mosquito-borne Disease, Rift Valley Fever, Other Mosquito-borne Disease

Mosquito-borne Disease (other): alphaviruses; flaviviruses

Tick-borne Disease: General Tick-borne Disease, Other Tick-borne Disease

Tick-borne Disease (other): flaviviruses

Zoonotic Disease: Hantavirus Pulmonary Syndrome

Resource Type:

format or standard characteristic of resource

Review

Timescale:

time period studied

Time Scale Unspecified